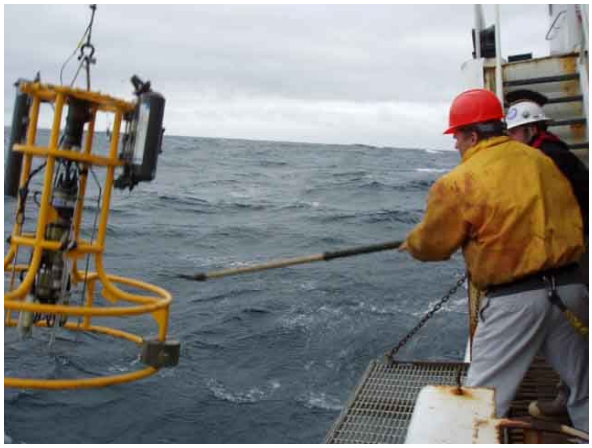
NOAA Teacher at Sea
Jim Jenkins
Onboard NOAA Ship MILLER FREEMAN
April 18 - 30, 2005

Day 11: April 28, 2005
Science and Technology Log:

CTD Tests

The past two days have been 12-hour workdays helping to do CTD tests. This involves putting an instrument into the water to measure the salinity, temperature and depth of the water in specific locations. All the data collected is stored in a computer file so that scientists can look at data the data for analysis.



Mr. Jenkins helps to retrieve a CTD.

I have an experiment that I would like you to try to see how salinity influences oceans. First, mix up some water with varying levels of salinity. You could do this by putting 1 teaspoon of salt in 100 ML of water, 2 teaspoons of salt in 100 ML of water, 3 teaspoons of salt in 100 ML of water and four teaspoons of salt in 100 ML of water. It would be a good idea to color these with a drop or two of the same color of food coloring. Label the cups and put them in order, least to greatest amount of salt.

Now, fill four cups with 100 ML of fresh water. It would be a good idea to put a drop or two of food coloring in these samples also. Make sure to pick a color that is different than the color used for the saltwater samples.

Gently pour the fresh water samples down the side of the container into the saltwater samples and record your observations. You may notice that the fresh water stays on top of the salt water because the salt water has a greater density than the fresh water. You are now on your way to understanding part of what CTD tests are all about. That is, saltier water tends to sink toward the bottom of the ocean while fresher water tends to be at the surface of the ocean.

You now may want to experiment with changing the temperatures of your specimens and recording your observations and thoughts. Your observations may lead you to conclude that colder water tends to sink while warmer water tends to rise. Understanding this will put you well on your way to understanding characteristics of seawater due to salt and temperature differences that are the basis of CTD tests.

Do you remember our discussion of the Walleye Pollock? You may remember that larva for the Pollock are in seawater and are influenced by currents which may transport the

larva, or bring food to the larva. The rise and fall of water due to temperature and salinity differences causes some of the currents that transport larva, or bring food to the larva through upwelling. Understanding how oceans circulate because of salinity and temperature differences and how this circulation influences ocean life is the basis of the measurements collected by CTD tests.

Please let me know how your experiments go. What are your observations and questions?

Ocean Birds

Yesterday, the ship was close to an island and lots of birds were following the ship or playing around the ship. I spent some time on the bridge looking at the birds through binoculars and reading about them in a bird book kept on the bridge. Let me tell you about a few of the more interesting birds I saw.

The most interesting bird to me was a brown bird that resembled a puffin in some ways. These birds tended to be in front of the ship. The spent a lot of time flying, then would plop down into the sea to rest for a while. They are great floaters and bobbed well in the 8-foot swell waves. This bird is called the Northern Fulmar (Fulmaris glacialis). What do you think of the species name?

The Northern Fulmar has had a habit of following whaling ships to feed on offal or blubber thrown over the side.

A lone sea bird.

A second bird, a gull, was larger and largely white. This bird, the Glaucous Gull, is also known as, "Chief magistrate of the North," because of some of its more peculiar habits. It has a habit of feeding on the eggs and unattended young of other birds. Its most curious habit is its tendency to confront a bird called and Eider which it forces to disgorge what it has eaten so that the Glaucous Gull can enjoy a good meal! What do you think of this?

A flock of sea birds fishes over the water.

Finally, the Laysan Albatross was a beautiful bird with a wonderful combination of straight edges and curves in its wings. This bird is an incredibly graceful flyer. Sailors and Pacific Islanders often refer to it as a "Gooney

Bird." This albatross feeds mainly on squid and tends to live in the open ocean, well away from shore.

You might want to ask you parents about the albatross. They are likely to tell you some great stories and even entertain you with a few lines of a poem they know!

Ocean Waves

Yesterday, a notation in the logbook read, "Confused Seas." Looking at the sea from the height of the bridge made this seem an apt description. Waves were bumping into other waves in locations causing sections of the ocean to be in churning turmoil.

Waves and an ice floe on the Bering Sea.

I noticed that the ocean waves caused by local winds were in the 1-2 foot range. Larger waves, or swell waves, were in the 8-foot range. Discussion with the officers on deck helped me to understand that swell waves, like regular waves are generally caused by wind. The winds causing the swell waves tend to be further away, however. In fact, the swell waves coming to us yesterday might be the result of winds causing waves in the water as far away as Japan. I think you might enjoy looking at a globe to fully appreciate this phenomenon.

Personal Log:

We are in transit today and a due to reach the site of a marine mammal mooring to be recovered tomorrow morning. It is nice to have the time to write logs and replies to you guys at a more leisurely pace.

Last night, I learned something about myself. Did you know that I smell, "greater than a toothpick and that I smell like a tree?" I thought that you would appreciate this description brought to you by 5-year-old Sam Jenkins!

Question(s) of the Day: Which whale is capable of the deepest dive? Which whale can hold its breath the longest? How are the Gray Whale's feeding habits different than the habits of other whales? (A great resource: http://cetus.ucsd.edu) Mrs. English may be able to help you with other good web resources. It would also be a great idea to visit Mrs. Griffith in the library!

Fondly,
Mr. Jenkins